



The National Cleaner Production Center - Macedonia

CP Assessment Report

Company: “BADZO” DOOL Export-Import, Bogdanci

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CP Assessment conducted by:
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Site visit: 10/09/2008 at the “BADZO” company premises

Assessment Methodology

The NCPC (National Cleaner Production Center) was contracted by the USAID’s AgBiz Program to conduct the initial Cleaner Production Assessment (CPA) to the AgBiz grantee “BADZO” company with the main aim to identify the CP options that could be applied in order to increase the environmental performance of the company refer to the waste minimization, primary selection and re-use of the waste, energy efficiency, reduction of raw materials consumption, possible technological and final products improvements and other production related issues.

The CP Assessment was conducted by two National CP Experts using the UNIDO CP Methodology, CP auditing form – questionnaire, input/output data and data on environmental performance and current operational practice received by the responsible persons of the company during the site visit and interview performed at the company premises.

During the one-day initial CP Assessment into the BADZO company two company representatives were participated in the discussions during the site visit and they provided us the relevant information and data: Mr. Tome Sapkarov, General Manager and Mr. Risto Danailov, Transport and Spedition Manager.

The Cleaner Production concept, aim and main tools and methods were introduced to the representatives at the beginning of the site visit and after on-site assessment the no-cost and low costs CP options were discussed.

Company profile

The “BADZO” DOOEL Company has been working almost 15 years (established in 1993) in the fresh vegetables and fruit sorting, packaging and trade business. It is 100% private company with 10 permanent employees and several (25-30) seasonal workers. There are nearly 170 permanent suppliers-farmers of fresh vegetables who cover around 80 % of the fresh supply and the rest has been come from its own greenhouses. The main raw materials are: tomatoes, cucumber,

cabbage, cauliflower, peppers, potatoes, onion, broccoli and the fruits water melon, grapes and plums. The company has been export oriented and almost 99% of the packaging fresh goods go the markets in Serbia, Croatia, Belorussia, Bulgaria, Czech Republic, Holland and Romania. The total production capacity on annual basis is 9500 t/year.

The “BADZO” DOOEL Company has also another plant in Kavadarci where they receive, pack and export around 1000 t/year of table grapes.

The company has been located into the light industrial zone on southwestern part of city of Bogdanci (belongs to the Bogdanci Municipality), on the right side of the regional road Gevgelija to Dojran. The company has around 8000 m² ground area with around 1000m² production roof space and 50 m² admin offices.

There are several few investments in 2008. The new cooling /heating store room 120 m² has been built and equipped with cooling system with the financial support by AgBiz Programme. In the moment of site visit only one unit of the system has been installed, and in the next few days the second unit would be installed, by subcontractor Frigotehna. In the next year company expect to build the new storage facility, due to the production expansion.

The BADZO Company has not achieved any certification according ISO, HACCP, or other environmental management or hygiene standard requirements, but according the responsible person they are intensively work on implementation of HACCP and ISO 9000.

Material Flow Analysis

There are two main storage facilities. The smaller and older one is used for the already packed products, where only product storing, weighting and load to trucks have been performed.

The other building, so called Packaging Center, was build four years ago and the main purposes are products calibration, packaging, palleting, storing, weighting and loading to trucks. The product storing could be on ambient temperature as well as in the new cooling/heating storage hall inside this Center, depending on the product type and season. The BADZO Company has very simple operations and the process flow is shown on Figure 1

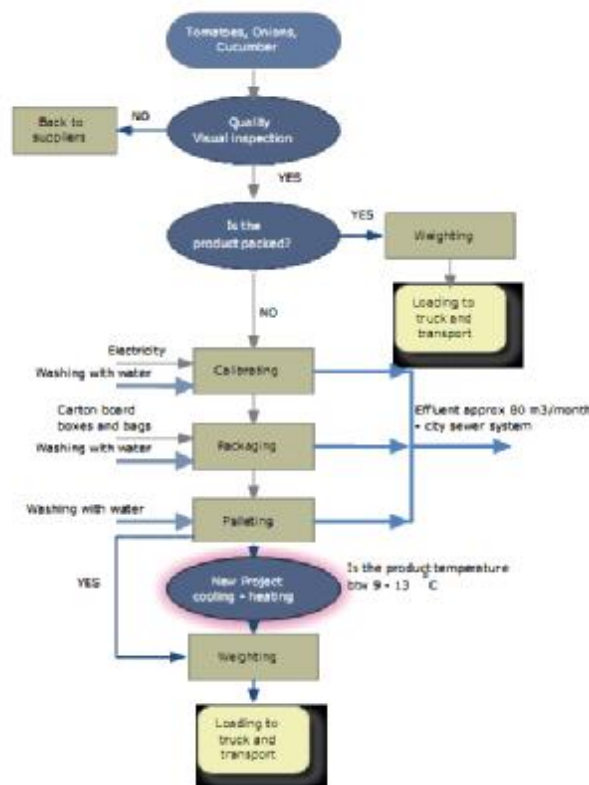


Figure 1 Production flow diagram

The main fresh vegetables are visually quality inspected, weighted and calibrated by specialized equipment and calibrated vegetables packed in boxes (cardboard, plastic or wooden) and in bags (cabbage, onions). Packed vegetables are palletted, weighted and loaded on trucks and transported.

The sorting, calibration and packing of grapes have been manually performed.

Products that are not suitable for export have been separated and sold to the food production companies (for example, tomatoes are used for the ketchup production and grapes for vinegar production). Small quantity of biological waste has been generated, collected from municipal public communal utility and final disposed on the municipal landfill.

Water

The Company use water from the communal water supply network for all needs. The main usage is for cleaning of floors and equipment and gardening, with average monthly consumption of 80 m³. According the Owner's statement there is no ground water down to 50 m and there is no possibility for well construction.

The waste water is discharged in the municipal sewage system. There is no control of the waste water quality.

Energy Management

The Company used only electricity for all energy needs. The average monthly costs according to the electricity bill, before cooling system has been installed are about 160 €. The cooling system (one unit) was put in to operation fifteen days ago and there is no information about expected higher costs.

In the winter period the electricity mainly has been used for offices hot water heating system. In the summer the office is air-conditioned. The installed machines are low energy consumers. The storage hall has not been heated in the winter.

In this year, the company has investments in the better building isolation to improve hall conditions and reduce costs for heating and cooling.

The other forms of energy (steam, hot water, compressed gases) have not been used at all.

The fuel is used only for transportation vehicles.

Environmental Performance of the Company

Due to the very simple technological process, there are no emissions of the exhaust gases to the atmosphere or the indoor air emissions. The only source of emissions belong to the dust created by the transportation vehicles within the company yard as there is no asphalt path to the Packaging Center from the entrance door.

There are no any emissions to the soil and water as the water has been used only for the cleaning proposes.

The main waste streams are: the organic-biodegradable waste generated by the products selection and sorting process (approximately 10 t/year, 1-5% of the sorted fruits and vegetables), the municipal and commercial waste consist of plastic bottles, paper, food, glass, etc.

The organic waste has been collected by the company employees, temporary disposed at the company plant into the metal barrels and with own tracks have been transported to the Bogdanci municipality landfill.

There is no any primary selection of the recycle materials like paper, plastic, glass and all municipal/commercial waste has been collected together into two metal barrels (200 lit.), temporary disposed at the plant. The final collection and disposal of the municipal waste has been done by the Public Communal Utility "Vodovod" on regular basis 2-3 times per week. Unfortunately, there is no practice of selection, collection and recycle of the secondary materials like paper, iron scrap, plastic bottles on the municipality level. There is no any company in the neighborhood dealing with recycle materials trading.

There is no separation of the municipal waste for the specific waste streams like: hazardous waste, batteries, accumulators, electric/electronic devices. Very small neglected quantity of various waste streams are expected and should be detailed assessed and identified.

There is no any inert waste or industrial hazardous waste.

There is no any usage of the chemicals in the very simple process, only the cleaning products in very small quantities are used.

There is no any noise, odor or vibrations from the technological process.

The main Environmental indicators, needed to identify cleaner production measures and activities have been given in the Table 1 and Table 2.

Table 1 Main parameters

<i>Main parameter for environmental indicator calculations</i>	<i>Quantity</i>	<i>Unit</i>
Number of permanent employees	10	employees
Number of seasonal workers	30	employees
Quantity of export vegetables/fruits	9500	t/year
Company ground area	8000	m ²
Water use	80	m ³ /month
Total amount of biodegradable waste	10	t/year
Total municipal waste	3	t/year
Total recyclable materials (expert assumptions)	900	kg/year

Table 2 The main environmental indicators

<i>Indicator</i>	<i>Value</i>
Biodegradable waste share into the total generated waste	77%
Biodegradable waste generated per exported products	0.11%
Municipal waste share into the total generated waste	23%
Generated total amount of waste per employee per day	0.29kg/employee/day
Possible quantity of recycle materials from the municipal waste	30%
Water consumption per ground area	10 lit/m ²

Current Operating Practices

The operations have been performed in the dry roofed and clean floor halls. The storage area is clean and well organized. There are no accumulations of liquid and solid waste on the floor. The season workers are working on the very small, non anatomic chairs and desks, exposed on the wind. The main lighting came form the open doors. The electrical lighting in this moment is not according to safety recommendations.

In this moment, the truck loading and unloading has been done by the hand fork lift.

The sorting machines are movable and they are moved into Packaging Center hall according to the actual product. The machines which are not currently in operation are situated into the roofed but open area behind the storage hall, together with palettes, fertilizers and etc. Due to the open area the machines are exposed to dust, moisture and corrosion.

In the older hall in the same place are stored fertilizers, tires and packaging boxes. In the moment of the site visit there are no products stored in the hall.

The permanent workers are very well motivated to fulfill their tasks. The company employee dealing with spedition and transport is very active into the introduction of the new simpler custom rules for transborder transportation of goods.

The season workers are also very well motivated, and there is no fluctuation to the other employers.

The company held good relationship with farmers (they provide them fertilizers), transportation sub contractors and local community.

Identification of CP Opportunities

Energy

Although the company is low energy consumer, there are few possibilities to introduce the CP concept.

1. For the reducing lightning costs the used tungsten bulbs has to be replaced with the energy efficient. **This is low cost CP option – 3 EUR/bulb;**
2. In winter, the office heating can be done by exciting air conditioner, instead of hot water heating unit. **This is no cost CP option.**
3. The few possibilities for the energy reductions in the new cooling/heating storage area:
 - a. Monitoring and regulation of cooling system (**no cost**),
 - b. Reducing cooled/heated area with the dividing the area in the smaller sections by movable walls (**low cost – 300 EUR**),
 - c. Usage automatically closing doors (**low cost**),
 - d. Good opening door management (**no cost**).
4. The electrical fork transportation vehicle could improve the needed time for the loading the tracks and will improve the production process (**high cost**).

Water

The water consumption and waste water related CP options include:

1. The reduction of the water consumption should be done using the high pressure low volume sprays with small diameter hoses and/or flow restricting spray nozzles (**300 EUR**);
2. The pre-soaking of floors and equipment should be done prior water cleaning (**no costs needed**);
3. Water for gardening should be used at the evening period and should be time controlled (**no cost**);
4. The regularly inspection and maintenance of the pipes and valves on the water supply system should be performed and immediately react (**no cost**);
5. At least one analysis of the waste water quality should be done on annual basis with main focus on the BOD and COD parameters (**low cost - 50 EUR/analysis**);
6. The evidence of the water consumption should be traceable (**no cost**).

Waste

The waste management related CP measures and activities involve:

1. Establish the small area for composting the biodegradable waste (10 t/year) producing compost for soil amendment (**low cost**);
2. Training on best practices on composting (**low costs**);
3. Continue with the collection and reuse rejected raw materials for manufacturing other products (**no cost**);
4. Primary selection of the recycle materials at the point of generation per waste streams: paper and cardboard, plastic bottles, wooden materials, cans, etc. (**no cost**);
5. Purchase of the separate small containers for different waste streams temporary disposal (**low cost-100 EUR**);
6. Finding possibilities for cooperation with the recycle materials traders for collection of the secondary material (**no cost**);
7. Primary selection of the waste stream of batteries, tires, electric devices etc. (**no cost**);
8. Preparation of the training instructions for the all employees for waste management and primary selection (**no cost**);
9. Provide leak-proof containers for collected solid and liquid waste (**low cost-50 EUR**);
10. The raw materials should preferably be sorted on the farm in order to minimize the quantity of waste generation at the plant (**no cost**);
11. Keeps the evidence of quantity, type of the waste stream according the national legislation (**no cost**);

12. The inert waste generated during the construction of the new hall should be managed immediately according the best practices **(low cost)**;
13. Preparation of the application for the IPPC-B environmental permit, according national legislation **(high cost)**.

CP options on Health and Safety issues

1. The HACCP standard recommendation should be applied taking into the account Good Manufacturing Practice (GMP), hygiene standard, staff hygiene and education, pest, chemical and allergen control, customer complains mechanism and traceability. Starting from January 2009 HACCP implementation is obligatory according the national health legislation **(high cost)**;
2. The anatomical chairs and working desks should be provided for the reducing personnel professional disease and injuries **(high cost)**;
3. The lightning in the working room must be set up according health and safety recommendations **(high cost)**;
4. All electric cables and equipment must be in cabinets or conduits **(low cost)**;
5. The selection and packing area should be separated from the storage area **(high cost)**;
6. The area where season workers are sitting should be well conditioned without draft **(high cost)**;
7. The moving paths and the machine, storage and working areas should be clearly marked **(low cost)**;
8. Maintain working and walking surfaces clean and dry by preventing accumulation waste on the floor **(no cost)**;
9. Construction of the dedicated rooms for the sorting machines, fertilizers, packaging boxes, packed products, liquids and chemicals and other auxiliary materials and tools **(high cost)**,
10. Construction of the entrance and manipulation path with the concrete or asphalt to avoid dust and dirt **(high cost)**;
11. The instructions for equipment handling and safety guidelines should be put on the wall near to the machine **(no cost)**.

Concluding Remarks and Recommendations

The BADZO Company is a small, innovative and perspective private company in agro business. The owner and the employees have put their efforts to implement the environmental pollution prevention measures, as well as, energy efficient practices, especially in the last year period. There is a room for further improvements, especially the implementation of the no/low CP options that will increase productivity, reduce business costs, improve the environmental performance of the company and obtain the compliant with the health and safety requirements.

The List with CP options should be delivered to the Badzo company general manager in order to review it and to make the prioritization between the CP options based on the financial, economic and human resources. Due to the fact that Badzo is dominantly packaging and trading company the CP options are mainly focus on improvement the current operating practices. The technology of composting, the training of the staff on composting practice and implementation of the HACCP standard seams like the most prospective actions incorporating the new technology aspect with in the Badzo business. Related to the energy, as small consumer, the main focus should be on involving energy efficient machines.

According our opinion a high priority for implementation of CP options should be put on the feasible, quick, no/low cost measures in parallel in all suggested areas. The responsible person should be nominated to deal with accomplishment of the CP options as well as traceability.

The Action Plan for the high cost CP option should be prepared according to company development strategy plan and financial possibilities and discussions with donors/international financial institutions.

The continuous training of the personnel on the different environmental and general management is crucial for increase the quality of the delivered products.

The environmental indicators should be reviewed, added and compare on annual basis to monitor the environmental performance of the company.

CP experts

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2. Zdravko Andonov

11.09.2008

Annexes

Photo documentation



The seasonal workers are sorting the grapes



The sorted grapes are ready for storage



There no separated space for the different materials



The tomato sorting machine is hidden by the packaging boxes and other materials



The main water consumption is gardening



Cables are not in conduits. The tungsten bulbs without lights are in use